Am1488

Quad RS-232C Line Driver

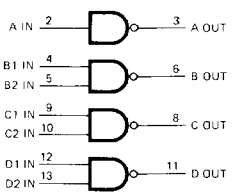
Distinctive Characteristics:

- Conforms to EIA specification RS-232C
- Short circuit protected output
- Simple slew rate control with external capacitor
- 100% reliability assurance testing in compliance with MIL STD 883
- TTL/DTL compatible input

FUNCTIONAL DESCRIPTION

The Am1488 is a quad line driver that conforms to EIA specification RS-232C. Each driver accepts one or two TTL/DTL inputs and produces a high-level logic signal on its output. The HIGH and LOW logic levels on the output are defined by the positive and negative power supplies to the drivers. For power supplies of plus and minus nine volts, the output levels are guaranteed to meet the ±6-volt specification with a 3kΩ load. There is an internal 300Ω resistor in series with the output to provide current limiting in both the HIGH and LOW logic levels. The Am1488 driver is intended for use with the Am1489 or Am1489A quad line receivers.

LOGIC SYMBOL



V− = Pin 1
= Pin 14
GND = Pin 7

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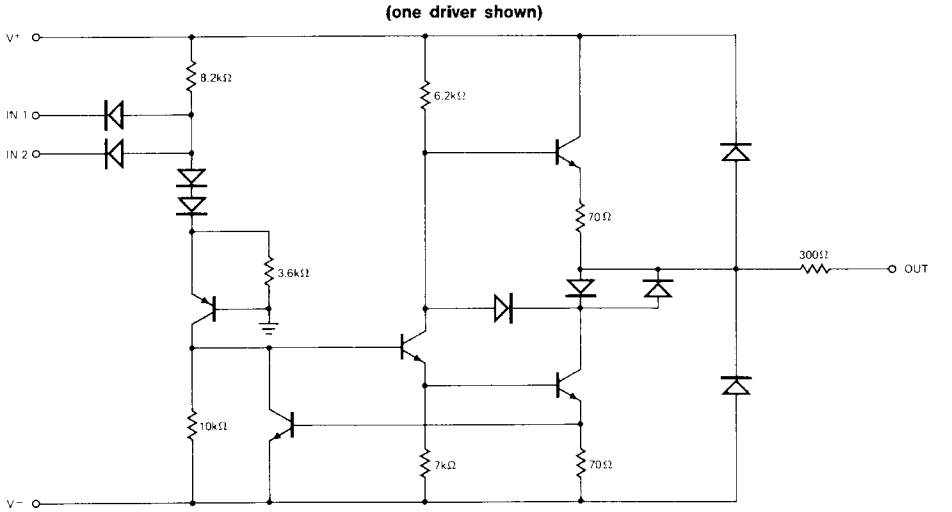
CIRCUIT DIAGRAM
(one driver shown)



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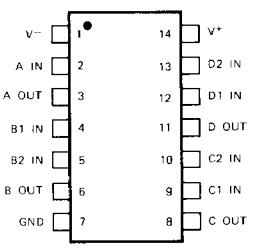
Am1488 ORDERING INFORMATION

Package Type	Temperature Range	Order Number
Hermetic DIP	0°C to +75°C	MC1488L
Molded DIP	0°C to +75°C	AM1488PC
Dice	0°C to +75°C	AM1488XC

CONNECTION DIAGRAM
Top View



NOTE: Pin 1 is marked for orientation.

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MAXIMUM RATINGS (Above which the useful life may be impaired)

Storage Temperature	−65°C to +175°C
Temperature (Ambient) Under Bias	0°C to +75°C
Supply Voltage to Ground Potential	V^+ +15V V^- −15V
DC Voltage Applied to Outputs for High Output State	$(V^+ +5.0V) \geq V_o \geq (V^- -5.0V)$
DC Input Voltage	±15V

ELECTRICAL CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE

The following conditions apply unless otherwise specified:

T_A = 0°C to +75°C, V^+ = +9.0V, V^- = −9.0V

Parameters	Description	Test Conditions		Min.	Typ. (Note 1)	Max.	Units
I_{IL}	Logical "0" Input Current	V_{IN} = 0V			−1.0	−1.6	mA
I_{IH}	Logical "1" Input Current	V_{IN} = +5.0V			0.005	10.0	μA
V_{OH}	High Level Output Voltage	R_L = 3.0kΩ, V_{IN} = 0.8V	V^+ = 9.0V, V^- = −9.0V	6.0	7.0		Volts
			V^+ = 13.2V, V^- = −13.2V	9.0	10.5		Volts
V_{OL}	Low Level Output Voltage	R_L = 3.0kΩ, V_{IN} = 1.9V	V^+ = 9.0V, V^- = −9.0V	−6.0	−6.8		Volts
			V^+ = +3.2V, V^- = −13.2V	−9.0	−10.5		Volts
I_{SC}^+	High Level Output Short-Circuit Current	V_{OUT} = 0V, V_{IN} = 0.8V		−6.0	−10.0	−12.0	mA
I_{SC}^-	Low Level Output Short-Circuit Current	V_{OUT} = 0V, V_{IN} = 1.9V		6.0	10.0	12.0	mA
R_{OUT}	Output Resistance	$V^+ = V^- = 0V$, V_{OUT} = ±2.0V		300			Ω
I_{CC}^+	Positive Supply Current (Output Open)	V_{IN} = 1.9V	V^+ = 9.0V, V^- = −9.0V		15.0	20.0	mA
			V^+ = 12V, V^- = −12V		19.0	25.0	mA
			V^+ = 15V, V^- = −15V		25.0	34.0	mA
		V_{IN} = 0.8V	V^+ = 9.0V, V^- = 9.0V		4.5	6.0	mA
			V^+ = 12V, V^- = −12V		5.5	7.0	mA
			V^+ = 15V, V^- = −15V		8.0	12.0	mA
I_{CC}^-	Negative Supply Current (Output Open)	V_{IN} = 1.9V	V^+ = 9.0V, V^- = −9.0V		−13.0	−17.0	mA
			V^+ = 12V, V^- = −12V		−18.0	−23.0	mA
			V^+ = 15V, V^- = −15V		−25.0	−34.0	mA
		V_{IN} = 0.8V	V^+ = 9.0V, V^- = −9.0V		−1.0	−15	μA
			V^+ = 12V, V^- = −12V		−1.0	−15	μA
			V^+ = 15V, V^- = −15V		−0.01	−2.5	mA
P_d	Power Dissipation	V^+ = 9.0V, V^- = −9.0V			252	333	mW
		V^+ = 12V, V^- = −12V			444	576	mW

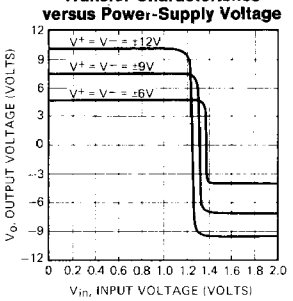
Switching Characteristics (T_A = 25°C, V^+ = +9.0V, V^- = −9.0V)

Parameters	Definition	Test Conditions	Min	Typ	Max	Units
t_{PLH}	Delay from input LOW to output HIGH	Z_L = 3.0 kΩ and 15 pF		275	350	ns
t_{PHL}	Delay from input HIGH to output LOW			110	175	ns
t_r	Output rise time			55	100	ns
t_f	Output fall time			45	75	ns

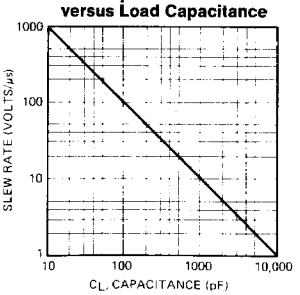
Note 1. Typical values are for T_A = 25°C.

TYPICAL CHARACTERISTICS

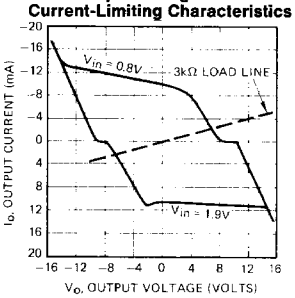
Transfer Characteristics versus Power-Supply Voltage

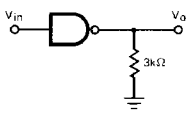


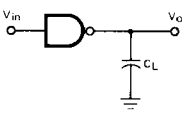
Output Slew Rate versus Load Capacitance

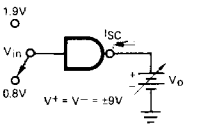


Output Voltage and Current-Limiting Characteristics

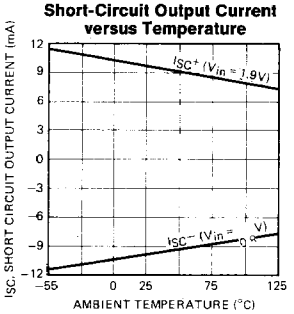




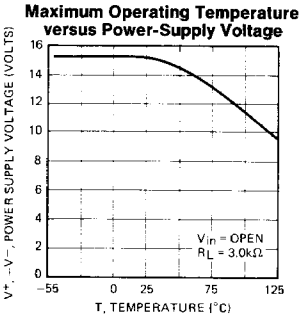




Short-Circuit Output Current versus Temperature



Maximum Operating Temperature versus Power-Supply Voltage



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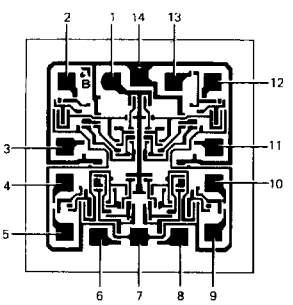
Metallization and Pad Layout



DIE SIZE 0.053" X 0.054"